

## PROGRAMMABLE AUTOMATIC CALLING SYSTEMS

### BACKGROUND OF THE INVENTION

This invention relates to improvements in automatic calling systems and more particularly to apparatus and methods for automatically accessing subscriber line systems through a switched telephone network and providing subscriber code information thereto wherein both the subscriber line system accessed and the code information provided are selectable at the option of the user. This application is related to U.S. Application Ser. No. 370,605 entitled "Automatic Calling Systems", filed on equal date herewith and assigned to the same assignee.

In U.S. Pat. No. 4,332,985 which is entitled "Automatic Calling Methods and Apparatus" and issued in the name of Richard I. Samuel on June 1, 1982, there are disclosed various embodiments of automatic calling systems for conveniently accessing a long-distance subscriber system through the automatic dialing of the telephone number therefor and providing the subscriber's billing code information thereto once the subscriber system has been contacted. This greatly facilitates use of such systems while avoiding the laborious task associated with a user first dialing a local telephone number to reach the computer associated with the switched subscriber system and entering the numerous digits associated with the subscriber's billing code once the computer controlling the system has been contacted. Thus, through reliance upon such apparatus and methods, a user may, in effect, employ such subscriber systems by doing little more than entering the area code and local telephone number of the ultimate destination to be contacted.

Automatic calling systems, as disclosed in the aforesaid patent, thus enable a subscriber to employ a particular long-distance subscriber system in a manner wherein all preliminary information for accessing such system is automatically produced by the automatic calling system to enable the long-distance subscriber systems to be utilized with much the same convenience as associated with the use of established telephone companies' long-distance services. Furthermore, such automatic calling systems as are described in U.S. Pat. No. 4,332,985 are otherwise highly advantageous since not only do they provide convenient use characteristics, which otherwise might preclude full utilization, but in addition thereto, access telephone numbers and billing codes need not be provided to the users. This insures that possible abuse of such systems by employees who might utilize such information outside of the work environment for personal ends is avoided.

Long-distance subscriber systems competing with established telephone company long-distance service have gained wide acceptance and the number of such services which are currently available have proliferated to a wide degree. Typically, each subscriber system employs the local switched telephone lines of the established telephone company to connect a subscriber to a computer which then acts to convey the subscriber's telephone call over privately owned, long-distance microwave networks or the like to a local area where the call is again reintroduced into the local switched telephone network where the same is completed to the location dialed. In many areas today, several long-distance subscriber systems are available to prospective

users and it is not unusual for each system to offer particular advantages which vary as a function of communication patterns of the user. Thus, it is not unusual for a relatively small business organization to subscribe to more than one service or for such organizations to change services from time to time. In fact, differing cost patterns among such long-distance subscriber systems as are available in particular areas have, in fact, spawned a new service industry wherein, in effect, a local subscriber system itself subscribes to a plurality of long-distance subscriber systems and a computer located at the local subscriber system is employed for the purpose of switching communications from subscribers over the various long-distance subscriber systems available on a least cost routing basis.

Regardless of the subscriber system or systems selected, the user is generally required to enter a seven digit local telephone number to gain access to such system over local switched telephone networks to a computer which controls the long-distance network or networks to be employed. The computer answers the lines and indicates that access has been gained by placing a tone or the like on the line. Upon hearing the tone, the user then enters an assigned billing code which currently may comprise from five to twelve digits, and thereafter the user typically dials the area code and telephone number of the remote location which is to be contacted through the subscriber system. Thus, it is not unusual in order to complete a call over such a computer-controlled long-distance subscriber system that a user at the subscriber site must input twenty-two or more digits in a manner timed to accommodate necessary handshaking with the computer controlling the long-distance system.

Obviously, where more than one long-distance subscriber system has been selected, each system would have a different telephone number and billing code which would be required to be input for the system selected, and it is not atypical for a subscriber to secure more than one billing code for a given location so that telephone charges may be properly relegated among different departments using common telephone lines at a given site. Under such circumstances, it will be apparent that if the convenience of automatic calling systems of the type set forth in U.S. Pat. No. 4,332,985 (Ser. No. 134,951) are to be retained at users locations having access to a plurality of subscriber systems, such automatic calling systems must be sufficiently flexible to accommodate an accessing of more than one long-distance subscriber system and to provide billing code information of the type required by a given system for each system accessed. Furthermore, it would be highly desirable to provide automatic calling systems wherein a number of specifically configured billing codes may be provided on a selectable basis for each subscriber system accessed and the accessed telephone numbers, billing code configurations and actual billing codes employed could be readily changed by a user to accommodate changes in the long-distance subscriber systems selected. Additionally, such systems should give the appearance of performing multiple service functions on a concurrent basis to effect service for a substantial number of users located at the subscriber's site. Further, such systems must be configured to readily accommodate the various handshaking requirements of the various long-distance subscriber systems which might be selected by a user.